

Remarks

In response to the outstanding rejections, claims 1 and 12 have been amended and claim 4 has been canceled as a consequence of the amendment of claim 1.

Support for the amendment of claim 1 is found on lines 21-25 of page 8 and for the amendment of claim 12 on lines 20-23 and 24-31 of page 6 and lines 1-2 of page 7.

Claim 12 was rejected per the second paragraph of 35 USC 112 as being indefinite.

The Examiner pointed out that the Mannich reaction product is derived from more components than the recited polyamines.

Claim 12 has been amended regarding the aldehyde and the polyamine components of the Mannich reaction product. The aldehyde is now termed "the aldehyde of the Mannich reaction product." The recited polyamines are now prefaced by the term "the polyamine of the Mannich reaction product is derived from the group consisting of . . ."

Applicants respectfully submit that amended claim 12 is definite regarding components of the Mannich reaction product.

Claims 1-10 and 13-15 were rejected under 35 USC 103(a) for obviousness.

The Examiner indicated that these claims were unpatentable over Cunningham (US 5,679,116) with Udelhofen (US 4,231,759) as an evidentiary reference.

Cunningham discloses fuel additive compositions and fuel compositions for intake valve deposit control comprising a) at least one detergent that is 1) a hydrocarbyl-substituted dicarboxylic acid derivative, 2) a hydrocarbyl-substituted polyamine and/or 3) a Mannich condensation product, b) a transition metal cyclopentadienyl complex, and c) a carrier fluid. Cunningham further discloses a most preferred Mannich detergent as described in Udelhofen that Cunningham incorporates by reference. Cunningham discloses that polyoxyalkylene compounds are preferred carrier fluids from line 61 of column 12 to line 45 of column 13. Cunningham teaches from line 61 of column 14 to line 5 of column 15 that optimum proportions of polyoxyalkylene compounds, when used alone as the carrier fluid, corresponds to a weight ratio

of detergent to carrier fluid in the range of about 0.05:1 to 0.5:1. Cunningham thus teaches that preferably the polyoxyalkylene compound is present in a greater amount than the detergent.

The present invention in amended claim 1 is a fuel composition comprising a hydrocarbon fuel, a detergent combination of a hydrocarbyl-substituted polyamine and a Mannich reaction product, and optionally a fluidizer comprising a polyether, a polyetheramine, or mixtures thereof where the weight ratio of the fluidizer to the detergent combination is less than 0.2. In the present invention the polyether/polyetheramine fluidizer is present in a lesser amount than the detergent combination. Cunningham and Udelhofen do not disclose or suggest the lesser amount of the polyether/polyetheramine fluidizer relative to the detergent combination of the present invention. Cunningham actually teaches away from the present invention to a greater level of the polyoxyalkylene compound carrier fluid relative to the detergent.

Applicants respectfully submit that claims 1-10 and 13-15 are patentable over Cunningham and its incorporated reference Udelhofen based on the above remarks.

Claims 11 and 12 were rejected under 35 USC 103(a) for obviousness.

The Examiner indicated that claims 11 and 12 were unpatentable over Cunningham (US 5,679,116) as applied to claims 1-10 and 13-15 above and further in view of Malfer (US 5,725,612).

Cunningham discloses, as indicated in the above remarks, a composition for use in fuels that comprises at least one detergent that is a succinic acid derivative, a polyamine and/or a Mannich condensation product, a transition metal complex, and a polyoxyalkylene compound carrier fluid where the weight ratio of the detergent to the carrier fluid ranges from about 0.05:1 to 0.5:1. Malfer discloses a Mannich condensation product for use in spark ignition fuels that can be derived from a polybutylene having at least a 70% vinylidene content. Malfer further discloses that a polyoxyalkylene compound carrier fluid can also be used to enhance performance where the weight ratio of the carrier fluid to the detergent ranges from about 0.3:1 to 2:1.

Claims 11 and 12 of the present invention depend indirectly from amended claim 1 in which the weight ratio of the polyether/polyetheramine fluidizer to the polyamine-Mannich

detergent combination is less than 0.2. Cunningham and Malfer either taken separately or in combination do not disclose or suggest the fluidizer to detergent combination weight ratio of less than 0.2 of the present invention in which the fluidizer is present in a lesser amount than the detergent combination. Cunningham discloses that polyoxyalkylene carrier fluid is present in greater amount than the detergent, while Malfer discloses a carrier fluid to detergent weight ratio range that lies above the fluidizer to detergent combination weight ratio values of the present invention.

Applicants respectfully submit based on the above remarks that amended claim 1 is patentable over Cunningham and Malfer taken alone or in combination and consequently that dependent claims 11 and 12 are also patentable over these two documents taken alone or in combination.

Claims 1-15 were rejected under 35 USC 103(a) for obviousness.

The Examiner indicated that these claims were unpatentable over Malfer (US 5,725,612) in view of Aiello (US 5,006,130).

Malfer discloses, as indicated in remarks hereinabove, a composition for spark-ignited fuels comprising a Mannich detergent that can be derived from a high vinylidene content polybutylene. The composition can further comprise a polyoxyalkylene compound carrier fluid where the weight ratio of the carrier fluid to the detergent ranges from about 0.3:1 to 2:1. Aiello discloses a gasoline fuel composition comprising gasoline, an oil-soluble polyamine detergent, and a carrier that includes a polyoxyalkylene compound where the weight ratio for the polyamine detergent to the polyoxyalkylene compound carrier is in the range of about 0.8 to 2.1 as indicated on lines 31-41 of column 4. This 0.8 to 2.1 range becomes about 0.48 to 1.25 (1 over 2.1 to 1 over 0.8) for the weight ratio of the carrier to the detergent.

Claims 2-15 of the present invention depend directly or indirectly from amended claim 1 in which the weight ratio of the polyether/polyetheramine fluidizer to the polyamine-Mannich detergent combination is less than 0.2. Malfer and Aiello either taken separately or in combination do not disclose or suggest the fluidizer to detergent weight ratio of less than 0.2 of the present invention. Both Malfer and Aiello disclose a range (about 0.3 to 2 for Malfer and

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about 0.48 to 1.25 for Aiello) for the weight ratio of the carrier fluid or carrier to the detergent that lies above fluidizer to detergent combination weight ratio values of the present invention.

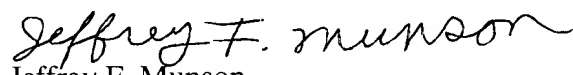
Applicants respectfully submit based on the above remarks that amended claim 1 is patentable over Malfer in view of Aiello and consequently that dependent claims 2-15 are also patentable over these combined documents.

From the foregoing amendments and remarks, it is submitted that the present claims are in condition for allowance and that the reply to this Office Action is fully responsive. An early and favorable reconsideration is respectfully requested. If the Examiner believes that only minor issues remain to be resolved, a telephone call to the undersigned is suggested.

Any deficiency or overpayment in fees for this application should be charged or credited to Deposit Account No. 12-2275 (The Lubrizol Corporation).

Respectfully submitted,

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Marked Up Version of the Amendment

IN THE CLAIMS

Claims 1 and 12 have been amended as follows:

1. (Once amended) A fuel composition useful for a spark or a compression ignition internal combustion engine, comprising:

a hydrocarbon fuel;

a combination of nitrogen-containing detergents comprising a hydrocarbyl-substituted polyamine and a Mannich reaction product of an alkyl-substituted hydroxyaromatic compound, an aldehyde, and a polyamine having at least one reactive N-H group; and

optionally a fluidizer comprising a polyether, a polyetheramine, or mixtures thereof;

wherein the weight ratio of the hydrocarbyl-substituted polyamine to the Mannich reaction product is about 0.2:1 to 1:0.2; each of the nitrogen-containing detergents is present at about 20-100 ppm by weight; and the weight ratio of the fluidizer to the combination of nitrogen-containing detergents is less than 0.[5]2.

12. (Once amended) The fuel composition of claim 11 wherein the aldehyde of the Mannich reaction product is formaldehyde; and the polyamine of the Mannich reaction product is derived from the group consisting of ethylenediamine, propylenediamine, diethylenetriamine, N,N'-dimethylethylenediamine, N,N,N'-trimethylethylenediamine, N,N-dimethylethylenediamine, N,N-dimethylpropylenediamine, N,N'-dimethylpropylenediamine, 2-(2-aminoethylamino)-ethanol, and mixtures thereof.

Claim 4 has been canceled.